

## **REMARKS/ARGUMENTS**

Applicants have received the Office Action dated September 17, 2008, in which the Examiner rejected claims 1-33 under 35 U.S.C. § 102(e) as allegedly anticipated by Rowlands (U.S. Pat. No. 6,993,631, hereinafter "Rowlands"). With this Response, Applicants amend claims 1, 4, 6, 7, 24, 28, 31 and 32 and cancel claims 5, 27, 29 and 30. Based on the amendments and arguments herein, Applicants respectfully submit that all pending claims are in condition for allowance.

### **I. CLAIMS 1-4 AND 6-14**

Claims 1-4 and 6-14 stand rejected as allegedly anticipated by Rowlands. As amended, independent claim 1 requires "wherein the second node transitions from the first state to a transition state associated with migration of the ordering point to the first node." Applicants respectfully submit that no portion of Rowlands appears to teach the recited limitation. Specifically, the Examiner analogizes the claimed "second node" to Rowlands' "other node" as taught in the Abstract. Office Action, p. 2. Based on this analogy, at a minimum, to anticipate this limitation, Rowlands would have to teach that this "other node" enters a "transition state" that is specifically associated with migration of the ordering point to the first node, as claimed. Rowlands does not appear to teach such a transition state. Moreover, the portion of Rowlands cited by the Examiner as teaching this limitation (col. 12, l. 66 – col. 13, l. 3; see Office Action, p. 4) does not even involve multiple nodes, so it at least appears to be impossible for this portion of Rowlands to teach "wherein the second node transitions from the first state to a transition state associated with migration of the ordering point to the first node," as claimed. Instead, this portion of Rowlands has to do with multiple "coherent agents" within a single node. See col. 12, ll. 28-30, which constitutes the topic sentence for the section cited by the Examiner. This topic sentence makes it clear that the ensuing discussion of Figure 5, which includes the cited text, describes coherent agents within a single node. Interaction between multiple nodes, as claimed, is not taught.

Because the Examiner has not cited any portion of Rowlands that teaches this limitation, and further because Applicants themselves are unable to find any such teaching in Rowlands, Applicants respectfully submit that claims 1-4 and 6-14 are patentable over Rowlands.

Independent claim 1 is patentable over Rowlands for an additional reason. Specifically, claim 1 requires “a first node that **broadcasts** a request for data” (emphasis added). The Examiner cites the Abstract and col. 21, ll. 27-43 as teaching this limitation. However, these portions of Rowlands do not teach that the first node broadcasts a request for data. Instead, Rowlands teaches a specific “transaction to a coherency block” by a first coherent agent in the first node. As known to those of ordinary skill in the art, a request that is “broadcast” by a node is very different from a particular transaction targeted at a particular node. Thus, claims 1-4 and 6-14 are patentable over Rowlands for at least this additional reason.

Dependent claim 4 is patentable for yet another additional reason. Claim 4 requires “wherein the first node comprises a processor having an associated cache that comprises plurality of cache lines, one of the cache lines having an address associated with the data, the second state identifying the one of the cache lines as the ordering point for the data in the system.” The Examiner cites col. 2, ll. 4-11 of Rowlands as teaching this limitation. Although this portion of Rowlands appears to describe a “second node” containing a cache that retains “[a] state ... for the first coherency block” and that the cache “is designated to retain the state,” Rowlands does not teach that its **first node** (which the Examiner says is analogous to the claimed “first node”) contains such a cache, nor does Rowlands teach that one of the cache lines has an address associated with the data, nor does Rowlands teach that a second state identifies one of the cache lines of that cache as an ordering point for the data in the system, as claimed. Apparently, all Rowlands teaches is a cache in the second node that retains a state. Such a teaching is hardly specific enough to anticipate claim 4. Thus, claim 4 is patentable over Rowlands for at least this additional reason.

Dependent claim 6 is patentable for an additional reason. Claim 6 requires “wherein the second node comprises a processor having an associated cache that comprises a plurality of cache lines, one of the cache lines of the second node that contains the data transitioning from the first state to the transition state associated with migration of the ordering point to the first node.” The Examiner cites Rowlands, col. 12, l. 66 – col. 13, l. 3 as teaching this limitation. Respectfully, the Examiner is mistaken. As previously explained, this portion of Rowlands merely discusses exclusive and modified states in the context of a single node. Because the cited text is described in context of multiple coherent agents in a single node, cache lines that transition states associated with migration of an ordering point between multiple nodes cannot be taught. Applicants are unable to find any teaching in Rowlands that would anticipate claim 6. Thus, claim 6 is patentable over Rowlands for at least this additional reason.

Dependent claim 7 is patentable for another reason. Claim 7 requires:

a multi-processor system implementing a source broadcast protocol, the system further comprising a third node that issues a broadcast request that is received at the second node while in the transition state, the third node reissuing the broadcast request as a request employing an associated forward progress protocol implemented in the system in response to receiving a conflict response from the second node.

The Examiner asserts that Rowlands, col. 22, ll. 16-33 teach a similar limitation; specifically, that an address transfer may be retried or cancelled to permit a modified cache block to be written to memory or for other coherency activity to occur. While this teaching of Rowlands may be somewhat analogous to the “reissuing” feature in claim 7, there appears to be no teaching that anticipates claim 7 in its entirety. Specifically, Applicants find no teaching in Rowlands concerning “source broadcast protocol,” “broadcast[ing]” a request from a third node that is received by a second node at a particular point in time when the second node is in a transition state, reissuance of the request by the third node using a forward progress protocol in response to receiving a conflict response

from the second node, etc. Claim 7 is more specific and detailed than a simple teaching of a request reissuance, as taught by Rowlands. Thus, claim 7 is patentable for this additional reason.

Claim 12 is patentable for an additional reason. Claim 12 requires “wherein the request for the data further comprises one of a source broadcast read request or a source broadcast write request for the data, and the response from the second node comprises a corresponding ownership data response.” The Examiner cites Rowlands, col. 9, ll. 47-60 as teaching this limitation (i.e., teaching a “write transaction”). Office Action, p. 7. As known to those of ordinary skill in the art, the mere teaching of a write transaction is not the same as a broadcast read request or a broadcast write request. As commonly known, broadcasting is different from simple read/write transactions. Thus, claim 12 is patentable over Rowlands for at least this additional reason.

## **II. CLAIMS 15-23**

Independent claim 15 requires “a source processor that issues a broadcast request for desired data while having a first state associated with the desired data.” The Examiner cites Rowlands, col. 21, ll. 27-43 as teaching this limitation. As explained several times above, Rowlands simply does not appear to teach broadcasting as required by claim 15. If Rowlands does not teach a limitation of claim 15, then Rowlands cannot anticipate claim 15 under 35 U.S.C. 102. Based on the foregoing, claims 15-23 are patentable over Rowlands.

Dependent claim 18 is patentable for an additional reason. Specifically, claim 18 requires “wherein the state associated with the cache line of the owner processor transitions from a first state to a transition state in connection with providing the ownership data response to the source processor.” The Examiner asserts that Rowlands, col. 2, ll. 4-11 teaches this limitation. However, as explained above with reference to claim 1, Rowlands fails to teach or suggest processor transitions on the owner processor (i.e., a processor on the second node in Rowlands). Absent any such teaching, Rowlands cannot anticipate this claim. Thus, claim 18 is patentable over Rowlands for this additional reason.

Dependent claim 19 is patentable for an additional reason. Claim 19 requires:

wherein the system employs a source broadcast protocol for controlling the broadcast request issued by the source processor and the response provided by the owner processor, the system further comprising a third processor that issues a broadcast request using the source broadcast protocol that is received at the owner processor while in the transition state, the third processor reissuing the request employing an associated forward progress protocol implemented in the system in response to receiving a conflict response from the owner processor.

As explained above with reference to claim 7, Rowlands fails to teach or even suggest such a limitation. Thus, claim 19 is patentable over Rowlands for this additional reason.

### **III. CLAIMS 24-26**

Independent claim 24 requires “means for reissuing a request in the system using a forward progress protocol in response to detecting a conflict while employing a source broadcast protocol in each of the means for broadcasting, the means for providing and the means for transferring.” The Examiner asserts that this limitation is taught by Rowlands, col. 22, ll. 16-33. Office Action, p. 15. The Examiner points out that this portion of Rowlands teaches that “address transfer may be retried, or cancelled (e.g.g[.] to permit a modified cache block to be written to memory, or other coherency activity to occur)[.]” However, mere re-trying or cancelling of an address transfer does not even remotely anticipate that **each** of means for broadcasting, means for providing and means for transferring, as each of these entities is claimed, employs a source broadcast protocol. This teaching certainly does not anticipate using a “forward progress protocol” for reissuing the request, and most certainly does not anticipate using the forward progress protocol for reissuing the request “in response to detecting a conflict while employing the source broadcast protocol,” as claimed. Thus, claims 24-26 are patentable over Rowlands for at least this reason.

**IV. CLAIMS 28-29 AND 31-33**

As amended, independent claim 28 requires “entering a transition state at the owner node in response to providing the ownership data response” and “releasing the owner node from the transition state in response to the migration acknowledgment signal.” The Examiner cites Rowlands, Abstract and col. 21, ll. 27-43, as teaching this limitation. Respectfully, the Examiner is mistaken. The claimed limitation teaches that the owner node that is providing the ownership data response enters a transition state. The owner node is subsequently released from the transition state in response to receipt of a migration acknowledgement signal. The cited portion of Rowlands, on the other hand, merely discloses that the “other node” records a state in which the coherency block is provided to the first node. There is no teaching of entering a transition state at the other node, particularly not in response to providing the ownership data response. As no transition state is taught, no release from a transition state can be taught, particularly not in response to the receipt of a migration acknowledgement signal. In fact, Applicants find no teaching of migration acknowledgement signals at all in Rowlands. Thus, based on the foregoing, claims 28-29 and 31-33 are patentable over Rowlands.

Dependent claim 31 is patentable for an additional reason. Claim 31 requires:

wherein the source node and the owner node employ a source broadcast protocol, the method further comprising:  
issuing a broadcast request for the requested data from a third node using the source broadcast protocol; and  
reissuing the broadcast request from the third node as a request using a forward progress protocol in response to the owner node being in the transition state when the owner node receives the broadcast request issued by the third node.

As explained above in context of claim 7, Rowlands fails to teach or suggest such a limitation. Thus, claim 31 is patentable for this additional reason.

**V. CONCLUSION**

In the course of the foregoing discussions, Applicants may have at times referred to claim limitations in shorthand fashion, or may have focused on a particular claim element. This discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the cited art which have yet to be raised, but which may be raised in the future.

Applicants respectfully request reconsideration and that a timely Notice of Allowance be issued in this case. It is believed that no extensions of time or fees are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required (including fees for net addition of claims) are hereby authorized to be charged to Hewlett-Packard Development Company's Deposit Account No. 08-2025.

Respectfully submitted,

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